Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER J. POPE
AND RICHARD B. WILLIS-OWEN

Appeal No. 93-3020
Application 07/623,701[1]

ON BRIEF

Before WILLIAM F. SMITH, KIMLIN, and GRON, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1-17, all the claims in the present application. Claim 1 is illustrative:

1. A top for sealing and insulating the open end of a cylindrical container subject to internal pressure variations, said top comprising a sealing and insulating member which comprises a central platform having an axially extending boss, with said platform having a plurality of vent membranes integrally formed therein, wherein each vent is designed to vent at approximately the same pressure, said membranes in combination comprising at least about 30% of the surface area of said platform exclusive of said boss portion, and means to strengthen the top.

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[1] Application for patent filed December 14, 1990.

The examiner relies upon the following reference as evidence of obviousness:

Markin *et al.* (Markin) 4,476,200 Oct. 9, 1984

Appellants' claimed invention is directed to a molded top for sealing and insulating the open end of a cylindrical container, such as a battery. As defined in claim 1 on appeal, the top comprises a central platform having a plurality of vent membranes integrally formed therein. Appealed claim 6 requires that the sealing and insulating member be made from a mineral-filled polyolefin.

Appellants submit at page 4 of their Brief that two separate groups of claims, claims 1-5, 7-10 and 13 (Group 1), and claims 6, 11, 12 and 14-17 (Group 2), stand or fall together. The first group of claims is not limited to filled polyolefin materials, whereas the second group of claims is. Accordingly, the Group 1 claims stand or fall together with claim 1, whereas the Group 2 claims stand or fall together with claim 6. Ex parte Schier, 21 USPQ2d 1016 (BPAI 1991).

Appealed claims 1-6, 13 and 14 stand rejected under 35 U.S.C. § 103 as being unpatentable over Markin. The final rejection of claims 7-12 and 15-17 was withdrawn by the examiner in the Answer.

We have carefully reviewed each of appellants' arguments for patentability. However, we concur with the examiner that the

claimed subject matter would have been obvious to one of ordinary skill in the art in view of the Markin disclosure. Accordingly, we will sustain the examiner's rejection for essentially those reasons expressed in the Answer and the final rejection, and we add the following primarily for emphasis.

There is no dispute that Markin discloses a top for sealing and insulating the open end of a battery having a vent membrane much like the one claimed. Appellants contend that the only teaching in Markin relating to multiple vent membranes is claim 5 of the reference, which calls for "said sealing and insulating member is formed so that at least one portion of area thereof ... is formed with a thickness less than the surrounding materials so as to provide a rupturable vent area of said member" (emphasis added). Appellants maintain that this recitation in claim 5 of the reference is simply "the contribution of the patent attorney that wrote the claims and is not a teaching by the inventor that multiple vent membranes are contemplated or desirable" (page 5 of Brief). However, as pointed out by the examiner, this is not the only mention in the reference of multiple vent membranes. To wit, at column 3, lines 14 et. seq., the reference discloses that "such sealing and insulating members can be provided that are injection moulded and may, when necessary, be moulded with rupturable membranes formed therein" (emphasis added). Consequently, based on these reference disclosures, we must

concur with the examiner that Markin provides a clear teaching to one of ordinary skill in the art that the sealing and insulating top member may contain a plurality of membranes.

Regarding the claim 6 requirement that the sealing and insulating member be made from a mineral-filled polyolefin, we again agree with the examiner that Markin provides a clear teaching of such. At column 9, lines 45 et. seq., Markin discloses "[M]aterials that have been contemplated and of which sealing and insulating members according to the present invention have been moulded include the following filled or unfilled resins: polypropylene, polyethylene, co-polymers of polypropylene with polyethylene..." (emphasis added).

Appellants have argued (Brief, pages 2-3) that each of the plurality of vent membranes in the sealing members they claim unexpectedly may be thicker than is the case when a single membrane is employed without affecting the pressure-venting capability and safety of the sealing members. Sealing members having thicker vent membranes seemingly are easier to form by conventional molding processes. We note, however, that the vent membranes in the sealing members appellants claim are not limited as to thickness. We also note that appellants base no argument upon objective evidence of unobviousness.

Also, claim 1 includes the following indefinite language, "said membranes in combination comprising between at least about

30% of the surface area of said platform." It would appear that 30% is the lower limit of a range having an unspecified upper limit. However, inasmuch as we are affirming the examiner's section 103 rejection of claim 1, we decline to exercise our discretion and enter a new ground of rejection under 35 U.S.C. § 112, second paragraph.

Under the provisions of 37 CFR § 1.196(d) the present application is remanded to the examiner for the purpose of entering the following recommended rejection of claims 11 and 12 which have been indicated to be allowable by the examiner. In particular, we recommend the rejection of claims 11 and 12 under 35 U.S.C. § 103 as being unpatentable over Markin and Kitk-Othmer. Claim 11 requires that the sealing member is formed of mineral filled polypropylene, wherein the mineral is either talc, calcium carbonate, mica, or mixtures thereof. Claim 12 is limited to the talc filled polypropylene. However, as discussed above, Markin discloses at column 4, lines 45 et seq., that the sealing member can be formed from filled polypropylene. Consequently, we find that it would have been prima facie obvious for one of ordinary skill in that art, following the teaching of Markin, to select any commercially-available filler, such as one of the conventional ones claimed, as a suitable filler for the polypropylene sealing material of the reference. We note that the specification herein attaches no particular significance or

criticality to the specific filler employed. Also, for the known use of mica, calcium carbonate and talc as fillers in plastics such as polypropylene, see Kirk-Othmer's Encyclopedia of Chemical Technology, Third Edition, Volume 15, p. 437 (mica); Volume 18, p. 172 (calcium carbonate); and Volume 22, p. 530 (talc)(copies attached to decision). Also, the specific amount of filler used would have been a matter of obviousness for the skilled artisan. In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

In conclusion, based on the foregoing, the examiner's decision rejecting claims 1-6, 13 and 14 is affirmed. The application is remanded to the examiner for entry of the recommended rejection under 37 CFR § 1.196(d).

Upon conclusion of the proceedings before the Primary Examiner on remand, this case should be returned to the Board by the Primary Examiner so that the Board may either adopt its decision as final or render a new decision on all of the claims on appeal, as it may deem appropriate. Such return for this purpose is unnecessary if the application is abandoned expressly or as a result of an unanswered Office action, allowed or again appealed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED AND REMANDED

WILLIAM F. SMITH
Administrative Patent Judge)
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EDWARD C. KIMLIN) BOARD OF PATENT
Administrative Patent Judge) APPEALS
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Appeal No. 93-3020
Application 07/623,701

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ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY

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MATCHES
TO
N-NITROSAMINES

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A process has been developed for coating sheets of high quality mica with gold and silver in specific patterns (24). These coated disks and stamped sheets are used in communication devices.

In helium–neon lasers, high quality natural sheet mica is used as retardation plates (see Lasers). Various industries have used mica as a special optical filter (see Filters, optical). Mica washers are used extensively by the computer industry. The small thin mica disks serve as gap separators in recording heads.

The planar surface of the mica used as gap separators and other specialties must be clear, unscratched, and untouched by hands. Disks are punched out of sheets, collected, collated with paper separators, and stacked together. The stacks are then put into a lathe vise and machined to the desired diameter to fit the close tolerances demanded by the customer.

Phlogopite is inferior to muscovite in many electrical properties but replaces muscovite as an electrical insulator where its ability to withstand temperatures up to 1000°C, compared with 500°C for muscovite, is applied.

Splittings and Built-Up Mica. Built-up mica from splittings serves as a substitute for natural sheet in electrical insulation applications. Built-up mica is the largest use of sheet mica and indispensable as an insulating medium in the electrical industry. It is used for segment plate, molding plate, flexible plate, heater plate, and tape.

Segment plate, the largest use of built-up mica, acts as insulation between the copper commutator segments of d-c universal motors and generators.

Molding plate is the sheet from which V-rings are cut and stamped for the insulation of copper segments from the steel shaft at the ends of a commutator. Molding plate is also fabricated into tubes and rings for insulation in transformers, armatures, and motor starters.

Flexible plate is used in electric motor and generator armatures, field-coil insulation, and magnet and commutator core insulation. Heater plate is used where high insulation strength at high temperatures is required.

In some types of built-up mica, the bonded splittings are reinforced with glass cloth, polyester film, Dacron mats, and varnished glass cloth. These products are very flexible and are produced in wide continuous sheets that either are shipped in rolls or first cut into ribbons, tapes, or any desired dimensions.

Scrap, Flake, and Ground Mica. High quality scrap mica is delaminated and used for the production of mica paper. Ground mica is used primarily in gypsum plasterboard cement where the mica acts as a filler and extender in the cement. Ground mica is used in the production of rolled roofing and asphalt shingles. The mica serves as an inert filler and surface coating to prevent sticking of adjacent surfaces. The coating is not absorbed by new roofing because mica has a platy structure and is not affected by the acid in the asphalt or by weathering (see Fillers).

Ground mica is used as a pigment extender which facilitates suspension, reduces checking and chalking, prevents shrinking and shearing of the paint film, increases resistance to water penetration and weathering, and brightens the tone of colored pigments (see Pigments).

In the rubber industry ground mica is used as an inert filler and mold lubricant in the manufacture of molded rubber products such as tires. The uses in the plastics industry are similar, where ground mica also acts as a reinforcing agent (see Fillers).

Other uses include decorative coatings on wallpaper and concrete, stucco, and

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TO
POTASSIUM COMPOUNDS

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rylate) [*19727-16-3*] (2-ethyl-2-hydroxymethyl-1,3-propanediol dimethacrylate) and other cross-linkable esters. All of these can be used with paste PVC resins to yield satisfactory plastisols. Formulation and processing of PVC with polymerizable plasticizers requires unusual expertise to develop the best possible properties. Plastisol stability depends on plasticizer structure and concentration as well as on the peroxide and PVC resin selected. Improved, ie, lowered, viscosity and increased hardness, modulus, and tensile strength can be achieved by replacing increasing amounts of primary plasticizer, DOP, or polyester. Tear and abrasion resistance first increase and then decrease with increasing methacrylate content (227). A peroxide, eg, di-*t*-butyl peroxide, usually is required at about 1 phr to polymerize the plasticizer as the resin fuses. The resin requires stabilization, and the stabilizers are at least somewhat antagonistic to the polymerization initiator. Improper processing can result in severe odor and color problems as well as poor hardness or low impact strength. Polymerizable plasticizers are especially useful in coatings where their use permits production of 100% solids coating materials (no volatile solvents) for application to steel, cloth, wood, paper or as a top coat for vinyl tile to improve stain and abrasion resistance.

Plastisol coatings with improved resistance to solvent swelling and extraction have been prepared by use of butylene glycol dimethacrylate to replace part of the DOP plasticizer. Polymerization by dicumyl peroxide progressed only to 60% of completion and further cross-linking was effected by γ-irradiation. Increasing the amounts of acrylate increased film strength and decreased solvent swelling. At ca 15–20 wt% acrylate, permeability and tear strength began to deteriorate again, perhaps signifying two phases (228).

Trimethylolpropane trimethacrylate [*3290-92-4*] at ca 10 phr and without added peroxide is incorporated in plastisol laminating adhesives that are intended for bonding PVC sheet to polyester cloth and other synthetic fabrics. Replacement of 10 phr of DOP can double the peel strength, but more effective compositions also contain a carboxyl-modified PVC as part of the resin and a moderate amount of a fast-fusing benzyl phthalate (229).

Plasticization by Fillers, Pigments, Salts, or Air

In a resin, nonreinforcing fillers, eg, precipitated calcium carbonate [*471-34-1*], chalk, kaolin [*1332-58-7*], silica, etc, usually are wet by the resin molecules, and secondary bonds form between them as do resin–resin and resin–plasticizer bonds (see Fillers). The normal effect of the filler is to stiffen the resin systems, ie, increase modulus and hardness. With increasing filler concentration, the tensile strength and ultimate elongation drops as the binder, ie, resin and plasticizer, becomes severely diluted with solid filler particles. However, small amounts of filler may behave abnormally yielding a product that has been softened as if by a liquid plasticizer. Only after additional filler is added to immobilize the polymer chains is the normal effect of the filler seen. This filler threshold is not as frequently documented in the literature as the plasticization threshold, nor is it clear how broad it is with regard to the resins and filler types that show the effect (230). A decrease in hardness of PVC floor-tile compositions consequent to incorporation of small amounts of calcium carbonate has been reported (9). It is probable that this effect results from some disruption of the crystallite structure of the PVC with an increase in free volume. Calcium carbonate fillers that are treated on the surface with fatty acids improve PVC physical prop-

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tremolitic) or pyrophyllite. Talc prevents delayed glaze crazing, lowers firing temperatures, and reduces fired shrinkage (17).

In Europe and Japan, talc is used in ceramics; electrical ceramics and steatite applications, however, outweigh wall tile. Talcs of high chemical purity and granular particle structure are the bases for low-loss insulators used in a wide variety of electronic and electrical uses (see Ceramics as electrical materials).

The next most important application is in protective coatings. Talc improves exterior durability and controls viscosity and brushing and gloss properties; it also reduces paint-formulation costs.

Other uses of talc are as insecticide carriers, rubber-dusting and textile-filling materials, and as an additive in asphalt roofing compounds. These applications account for large tonnage, but a relatively small proportion of total value, since only low quality talcs are employed.

More recently, the use of talc for plastics filling and reinforcement has grown rapidly (18) (see Fillers). Polypropylene parts reinforced with as much as 40% talc have replaced metal in many automotive applications as manufacturers have strived for weight reduction and improved gasoline mileage. Talc lends resistance to heat distortion and therefore is especially important in under-the-hood uses such as fan shrouds. Polypropylene replacements for metal in domestic applications represents another important new market for talc (see Engineering plastics). It is estimated that polypropylene uses consume >40,000 t of talc per year in the United States, and Europe and Japan each use >50,000 t/yr. Growth should be more rapid than that of the industries served as new applications are found.

Catalytic converters for automotive pollution control have also become important talc consumers since the mid-1970s. The honeycomb substrate requires raw materials of exacting specifications with respect to mineralogical purity and particle-size distribution. Worldwide volume of talc usage in this application is estimated at 20,000 t/yr (see Exhaust control, automotive).

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